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document *New Evolutionary Synthesis Tool for Modelling Young Star Clusters in Merging Galaxies New Evolutionary Synthesis Tool for Modelling Young Star Clusters in Merging Galaxies New ES Tool for Modelling YSCs in Merging Galaxies Peter Anders1 Richard de Grijs2 Uta Fritze - v. Alvensleben1

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Introduction Globular cluster systems (GCSs) are vital tools for investigating the violent star formation histories of their host galaxies. This violence could e.g. have been triggered by galaxy interactions or mergers. The basic observational properties of a GCS are its luminosity function and color distributions (number of clusters per luminosity resp. color bin).

A large number of observed GCSs show bimodal color distributions, which, by comparison with evolutionary synthesis (ES) models, can be translated into bimodality in metallicity and/or age. An additional uncertainty comes into play when one considers extinction within the host galaxy.

These effects can be disentangled either by obtaining spectroscopic data for the clusters or by imaging observations in at least four passbands. This allows us then to discriminate between various formation scenarios of GCSs, e.g. the merger scenario by Ashman & Zepf AZ and the multi-phase collapse model by Forbes et. al. Forbes.

Young and metal-rich star cluster populations are seen to form in interacting and merging galaxies. We analyse multi-wavelength broad-band observations of these young cluster systems provided by the ASTROVIRTEL project.

Modelling multi-wavelength star cluster data

We have further extended the Göttingen evolutionary synthesis code by including the effects of gaseous emission. The gaseous emission contributes significantly to the integrated light of stellar populations younger than $3{\cdot}10^7$ years Andersa; see Figure fig1. In addition, the effect of various amounts of *internal* dust extinction has been included.

The simultaneous determination of a cluster's age, metallicity, extinction and mass is achieved by comparing an appropriate grid of ES models with the observed spectral energy distribution (SED) in a least-squares sense. Examples for model SEDs are shown in Figure fig2.

Due to the well-known age-metallicity degeneracy (and a similar age-extinction degeneracy) at optical wavelengths (and the scaling of a cluster's luminosities with its mass), the use of multi-passband observations is essential to determine these parameters independently.

figure[ht] [width=0.5]andersF1.eps [width=0.5]andersF2.eps Time evolution of the gaseous emission contribution to broad-band fluxes in Johnson passbands U, B, V, I, and K at low metallicity $\mathrm{Z} = 0.0004$ (left panel) and solar metallicity (right panel). fig1